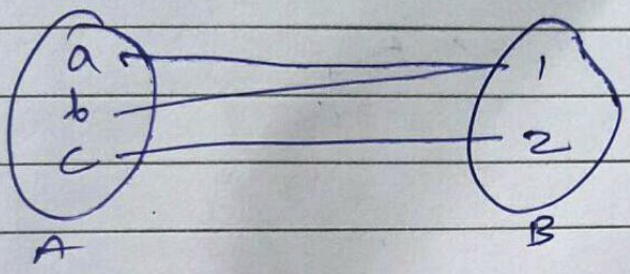
(2) onto mapping –

If f be a mapping such that each element of B is f-image of atleast one element of A then the mapping f is said to an onto or surjective mapping.

In onto mapping $f(A) = B$ symbolically a mapping $f: A \to B$ will be $\{f(x) : x \in A\} = B$



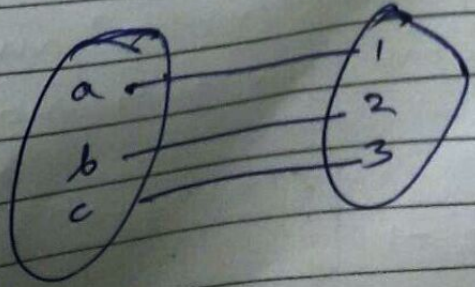
(3) one-one mapping –

Let $f: X \to Y$ be a mapping. If all distinct elements of the domain X has distinct images in Y. then the mapping f is said to one-one or injective mapping.

If $x_1 \neq x_2 \Rightarrow f(x_1) \neq f(x_2)$

or

If $f(x_1) = f(x_2) \Rightarrow x_1 = x_2$



(4) Many-one mapping -

Let $f: X \to Y$ be a mapping. If two or more than two elements of the domain X have the same image in Y then the mapping f is said to be many one mapping.

If $x_1 \neq x_2 \Rightarrow f(x_1) = f(x_2)$

Ques 1 - Discuss the mapping $f: R \to R$ defined by $f(x) = x^2$, where R is the set of real numbers.

$f(x) = x^2$

$f(1) = 1$

$f(-1) = 1$

$\therefore$ Many-one mapping.

Ques 2 - If $X = \{-1, 1\}$ and $f(x) = x^3$ and $f: X \to X$ then prove that f is one-one onto mapping.

$f(x) = x^3$

$f(1) = 1, \; f(-1) = -1$ $\left\{ f(x) = \{-1, 1\} = X \right\}$